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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/922,859	08/07/2001	Hidenori Kawata	110097	8536
25944	7590	11/03/2003	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			QI, ZHI QIANG	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 11/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/922,859	KAWATA, HIDENORI	
	Examiner	Art Unit	
	Mike Qi	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 5, 11-13, 16, 17 and 19-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-10, 14, 15, 18 and 31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>4/1/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's election with traverse of Aug.20, 2003 in Paper No. 8/20/2003 is acknowledged. The traversal is on the ground(s) that Applicant requests withdrawal of the Restriction requirement. This is not found persuasive because this application contains five embodiments for the first light shielding film arrangement such as the first light shielding film including a metal layer M1 formed on the TFT substrate and a barrier layer B1 formed on the metal layer M1 (Figs.1-3); the first light shielding film including a barrier layer B2 formed on the TFT substrate and the metal layer M1 formed on the barrier layer B2 (Fig.4); the first light shielding film includes a metal layer M3 and two barrier layer B3 and B4 (Fig.5); the first shielding film includes metal layer M4,M5 and M6 and a barrier layer B3 (Fig.6) and the first shielding film includes metal layer M3 and barrier layer B4 and B5; and that would need different searches according to the corresponding claims.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 5,11-13,16-17,19-30 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected claims, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. on date of 8/20/2003.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4, 6 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant admitted prior art (AAPA) in view of US 2002/0018164 (Ko et al) and JP 63-274929 (Matsushita et al).

Claims 1 and 14, AAPA discloses (paragraph 0004 – paragraph 0010; Fig.15) that an electro-optical apparatus comprising:

(concerning claim 1)

- a pair of substrates (10, 20);
- a liquid crystal (50) as an electro-optical material disposed between the pair of substrates (10,20);
- TFT (30) as a switching element disposed on one of the substrates (10);
- a light shielding film (11a) disposed at a location opposing the switching element (TFT 30), and the light shielding film (11a) made of a refractory metal compound such as WSi (tungsten silicide);

(concerning claim 14)

- an insulating substrate (10) such as glass;
- a light shielding film (11a) disposed on the insulating substrate (11a), and the light shielding film (11a) made of a refractory metal compound such as WSi (tungsten silicide).

AAPA does not expressly disclose the light shielding film including a metal layer

formed of a refractory metal in a simple substance form or a refractory metal compound and a barrier layer (also made of a refractory metal or a refractory compound containing no oxygen) disposed on at least one surface of the metal layer.

However, Ko discloses (paragraph 0070; Fig.7A) that the black matrix (43) formed of a double-layer of Cr and CrNx (no oxygen) and disposed on the second substrate (41). Therefore, the refractory metal Cr (high-melting-point metal) would be the metal layer and the refractory metal compound CrNx (no oxygen) would be the barrier layer to form the light shielding film (black matrix).

Although Ko does not expressly disclose the advantage to use such black matrix in a liquid crystal display device, but Matsushita discloses (Abstract; Fig.1) that uses two layers structure of the light shielding films (4A and 4B) with a high light shielding rate, in which the metal (such as chromium) light shielding film having high light shielding rate, and the layer containing titanium (also is a refractory metal) preventing the reflection due to the metallic luster of the metal film. Therefore, the two layers structure of the light shielding film would improve the performance of the light shielding.

Since the two layers structure of the light shielding film has a high light shielding rate and prevents the reflection due to the metallic luster, so that would improve the performance of the light shielding.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use two layers structure of the light shielding film as claimed in claims 1 and 14 for achieving high light shielding rate and improving the performance of the light shielding.

Claims 2 and 3, AAPA (Fig.15) discloses that the light shielding film (11a) being disposed between the one of the substrates (10) and the switching element (TFT 30) and the light shielding film facing the liquid crystal layer (the electro-optical material). Concerning the barrier layer disposed on the side facing the switching elements, that is the same limitation described in claim 1 such as the barrier layer disposed on the metal layer and that means must be facing the TFT; and as the explanation of the AAPA in view of Ko and Matsushita above that would have been at least obvious.

Claim 4, concerning the light shielding film including a light shielding metal layer and a light-absorbable metal layer as the explanation of the AAPA in view of Ko and Matsushita above, such as Matsushita discloses (Abstract; Fig.1) that uses two layers structure of the light shielding films (4A and 4B) with a high light shielding rate, in which the metal (such as chromium) light shielding film having high light shielding rate, and the layer containing titanium (also is a refractory metal) preventing the reflection due to the metallic luster of the metal film, that is to absorb the reflection due to the metallic luster of the metal film. Therefore, the two layers structure of the light shielding film would improve the performance of the light shielding. Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use two layers structure of the light shielding film as claimed in claim 4 for achieving high light shielding rate and improving the performance of the light shielding.

Claim 6, AAPA discloses (Fig.15) that the light shielding film (11a) serving to define a display area, because the light shielding film (11a) disposed corresponding to

the pixel area. All the limitations in claim 6 are the same as the claim 1, and that would be a redundant claim.

5. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA, Ko and Matsushita as applied to claims 1-4, 6 and 14 above, and further in view of US 6,521,913 (Murade).

Claim 7, AAPA, Ko and Matsushita do not expressly disclose the light shielding film being connected to a fixed potential.

However, Murade discloses (col.10, lines 14 – 31) that the light shielding film is connected to a constant potential source, that is the light shielding film being connected to a fixed potential, and with this configuration, the characteristics of the thin film transistor are prevented from being changed and deteriorated due to variation in the electric potential of the light shielding film.

Since the light shielding film being connected to a fixed potential would prevent the characteristics of the thin film transistor changing and deteriorating, because there are no variation in the electric potential of the light shielding film.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the light shielding film being connected to a fixed potential as claimed in claim 7 for preventing the characteristics of the thin film transistor changing and deteriorating.

Claims 8 and 9, Ko discloses (paragraph 0070; Fig.7A) that the black matrix (43) formed of a double-layer of Cr and CrNx and disposed on the second substrate (41). Therefore, the refractory metal Cr (high-melting-point metal) would be the metal layer

and the refractory metal compound CrN_x (i.e., a nitride compound) would be the barrier layer to form the light shielding film (black matrix). Matsushita discloses (Abstract; Fig.1) that uses two layers structure of the light shielding films (4A and 4B) with a high light shielding rate, in which the metal (such as chromium) light shielding film having high light shielding rate, and the layer containing titanium (also is a refractory metal) preventing the reflection due to the metallic luster of the metal film. Therefore, the two layers structure of the light shielding film would improve the performance of the light shielding. Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use a nitride compound for the material of the barrier layer as claimed in claim 8 for improving the performance of the light shielding. Concerning the claim 9, using WSi to form the barrier layer that would have been an obvious variation. Because the material of the barrier layer also is a refractory metal or refractory metal compound, and the material WSi is a refractory metal compound having an excellent ability to block light.

Claim 10, Murade discloses (col.9, lines 36 –45) that the material of the light shielding film uses Ti, because Ti is a opaque high-melting-point metal and using Ti as the metal layer for the light shielding film would prevent from being broken or melted by a high temperature. Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use Ti as the metal layer for the light shielding film as claimed in claim 10 for preventing from being broken or melted by a high temperature.

6. Claims 15, 18 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0018164 (Ko et al) in view of JP 63-274929 (Matsushita et al).

Claims 15, 18 and 31, Ko discloses (paragraph 0070; Fig.7A) that the black matrix (43) formed of a double-layer of Cr and CrNx (no oxygen) and disposed on the second substrate (41). Therefore, the refractory metal Cr (high-melting-point metal) would be the metal layer and the refractory metal compound CrNx (no oxygen) would be the barrier layer (the function must be a protection layer disposed on the surface of the metal layer) to form the light shielding film (black matrix).

Although Ko does not expressly disclose the advantage to use such black matrix in a liquid crystal display device, but Matsushita discloses (Abstract; Fig.1) that uses two layers structure of the light shielding films (4A and 4B) with a high light shielding rate, in which the metal (such as chromium) light shielding film having high light shielding rate, and the layer containing titanium (also is a refractory metal) preventing the reflection due to the metallic luster of the metal film. Therefore, the two layers structure of the light shielding film would improve the performance of the light shielding.

Since the two layers structure of the light shielding film has a high light shielding rate and prevents the reflection due to the metallic luster, so that would improve the performance of the light shielding.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use two layers structure of the light shielding film as claimed in claims 15, 18 and 31 for achieving high light shielding rate and improving the performance of the light shielding.

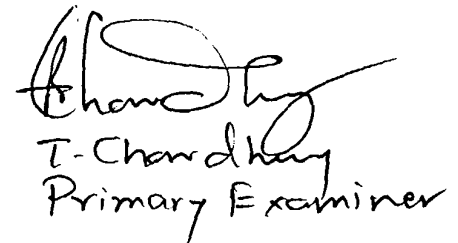
Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (703) 308-6213.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Mike Qi
October 10, 2003


T. Chandhry
Primary Examiner